IPv6 Operations
Internet-Draft
Intended status: Standards Track
Expires: December 23, 2016

T. Anderson
Redpill Linpro
June 21, 2016

64::/16: An IPv4/IPv6 translation prefix
draft-anderson-v6ops-v4v6-xlat-prefix-01

Abstract

This document reserves the IPv6 prefix 64::/16 for use with IPv4/IPv6 translation mechanisms.

Status of This Memo

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Table of Contents

1. Introduction

[RFC6052] reserves the IPv6 prefix 64:ff9b::/96 for use with IPv4/IPv6 translation mechanisms using the stateless IP address translation algorithm specified in the same document.

This document extends this reservation to 64::/16. This facilitates the co-existence of multiple IPv4/IPv6 translation mechanisms in the same network without requiring the use of a Network-Specific Prefix.

2. Terminology

This document makes use of the following terms:

Network-Specific Prefix (NSP)
: A globally unique prefix assigned by a network operator for use with and IPv4/IPv6 translation mechanism, cf. [RFC6052]

Well-Known Prefix (WKP)
: The prefix 64:ff9b::/96, which is reserved for use with the [RFC6052] IPv4/IPv6 address translation algorithm.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

3. Problem Statement

Since the WKP 64:ff9b::/96 was reserved by [RFC6052], several new IPv4/IPv6 translation mechanisms have been defined by the IETF. These target various different use cases. An operator might therefore wish to make use of several of them simultaneously.

The smallest possible prefix supported by the [RFC6052] algorithm is a /96. Because the WKP is a /96, an operator preferring to use a WKP

over an NSP can only do so for only one of his IPv4/IPv6 translation mechanisms. All others must necessarily use an NSP.

The WKP is reserved specifically for use with the algorithm specified in [RFC6052]. More recent IETF documents describe IPv4/IPv6 translation mechanisms that use different algorithms. An operator deploying such mechanisms can not use of the WKP in a legitimate fashion.

Section 3.1 of [RFC6052] imposes certain restrictions on the use of the WKP. These restrictions might conflict with the operator's desired use of an IPv4/IPv6 translation mechanism.

In summary, there is a need for a prefix that facilitates the co-existence of multiple IPv4/IPv6 translation mechanisms (that do not necessarily use the [RFC6052] algorithm).

4. Choosing 64::/16

The prefix described in this document is intended as a generic reservation that may be used for all present and future IPv4/IPv6 translation mechanisms, including the one described in [RFC6052]. Therefore, in order to prevent needless fragmentation of the IPv6 address space, it is prudent to choose a prefix that encompasses the [RFC6052] WKP.

The [RFC6052] algorithm specifies possible prefix lengths as short as /32. As previously discussed in Section 3, this document intends to facilitate simultaneous operation of multiple IPv4/IPv6 translation mechanisms in a single network. This means that the reservation must necessarily have a prefix length shorter than /32. Furthermore, as IPv6 addresses are divided into groups of 16 bits each, it is natural to use a prefix length that aligns with a 16-bit boundary.

Taking all the above considerations account, the only possible prefix value remaining is 64::/16.

5. Deployment Considerations

64::/16 is intended as a technology-agnostic and generic reservation. A network operator may freely use it in combination with any IPv4/IPv6 translation mechanism deployed within his network.

By default, IPv6 nodes and applications must not treat IPv6 addresses within 64::/16 and outside 64:ff9b::/96 different from other globally scoped IPv6 addresses. In particular, they must not make any assumptions regarding the syntax or properties of those addresses (e.g., the existence and location of embedded IPv4 addresses), or the

type of associated translation mechanism (e.g., whether it is stateful or stateless).

64:ff9b::/96 may only be used according to [RFC6052].

64::/16 or any other more-specific prefix may not be advertised in inter-domain routing, except by explicit agreement between all involved parties. Such prefixes MUST NOT be advertised to the default-free zone.

6. IANA Considerations

The IANA is requested to reserve the IPv6 prefix 64::/16 for use with IPv4/IPv6 translation.

7. Security Considerations

The reservation of 64::/16 is not known to cause any new security considerations beyond those documented in Section 5 of [RFC6052].

8. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <http://www.rfc-editor.org/info/rfc2119>.

[RFC6052] Bao, C., Huitema, C., Bagnulo, M., Boucadair, M., and X. Li, "IPv6 Addressing of IPv4/IPv6 Translators", RFC 6052, DOI 10.17487/RFC6052, October 2010, <http://www.rfc-editor.org/info/rfc6052>.

Appendix A. Acknowledgements

The author would like to thank Holger Metschulat for contributing to the creation of this document.

Author's Address

Tore Anderson
Redpill Linpro
Vitaminveien 1A
0485 Oslo
Norway

Phone: +47 959 31 212
Email: tore@redpill-linpro.com
URI: http://www.redpill-linpro.com